

**Stantec Analytical Validation Checklist****Report No. ATA27**

Project Name: Amtrak North Yard	Project Number: 213402048
Validator: Sarah Von Raesfeld	Laboratory: Eurofins/Lancaster Laboratory
Date Validated: 10/16/2018	Laboratory Project Number: 1583223
Sample Start-End Date: 08/06/15-08/07/15	Laboratory Report Date: 09/22/15
<p>Parameters Validated:</p> <p>Semi-volatile Organic Compounds (SVOCs) by EPA SW-846 3510C/8270C</p> <p>Volatile Organic Compounds (VOCs) by EPA SW-846 5030B/8260B</p> <p>Nitrate-NO2 and Nitrate-NO3 by EPA 353.2</p> <p>Chloride and Sulfate by EPA 300.0</p> <p>Sulfide by Standard Method (SM) 4500-S2D</p> <p>Total Organic Carbon (TOC) by SM5310C</p> <p>Ferrous Iron by SM3500-FeB</p> <p>Total Alkalinity by SM2320B</p> <p>Target Analyte List Metals by EPA SW-846 3005A/6010B</p> <p>Mercury by EPA SW-846 7470A</p>	
<p>Samples Validated:</p> <p>EB_20150806, LL# 7998539-40</p> <p>TB_20150806, LL# 7998541</p> <p>MW-6, LL# 7998542, 7998546</p> <p>MW-6MS, LL# 7998543, 7998547</p> <p>MW-6MSD, LL# 7998544, 7998548</p> <p>MW-6DUP, LL# 7998545, 7998549</p> <p>MW-19, LL# 7998550-51</p> <p>MW-7, LL# 7998552-53</p> <p>DUP-2, LL# 7998554-55</p> <p>MW-25, LL# 7998556-57</p> <p>MW-34, LL# 7998558-59</p> <p>MW-40, LL# 7998560-61</p> <p>TB_20150806, LL# 7998562</p> <p>MW-42, LL# 7998563-64</p> <p>MW-37, LL# 7998565-66</p> <p>MW-13, LL# 7998567-68</p> <p>MW-9, LL# 7998569-70</p> <p>MW-38, LL# 7998571-72</p> <p>TB_20150807, LL# 7998573</p> <p>MW-36, LL# 7998574-75</p> <p>MW-33, LL# 7998576-77</p> <p>AB20150807AB, LL# 7998578</p>	
<b>VALIDATION CRITERIA CHECK</b>	
<p>Validation Flags Applicable to this Review:</p> <p><b>U</b> The analyte was analyzed for, but not detected above the reported sample quantitation limit.</p> <p><b>J</b> The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.</p>	

<b>J+</b>	Result is estimated quantity but the result may be biased high.		
<b>J-</b>	Result is estimated quantity but the result may be biased low.		
<b>UJ</b>	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.		
<b>NJ</b>	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.		
<b>B</b>	The analyte was detected in the method, field, and/or trip blank.		
<b>R</b>	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.		
1.	Were all the analyses requested for the samples submitted with each COC completed by the lab?	Yes <b>X</b>	No
Comments:			
2.	Did the laboratory identify any non-conformances related to the analytical result?	Yes <b>X</b>	No
<ul style="list-style-type: none"> <li>The laboratory narrated MS and MSD spike recoveries for SVOCs, TOC, and anions that did not meet laboratory-established criteria.</li> <li>The laboratory narrated duplicate RPDs that exceeded laboratory-established criteria for metals</li> <li>Holding times were exceeded for general chemistry parameters</li> </ul>			
3.	Were sample Chain-of-Custody forms complete?	Yes <b>X</b>	No
Comments:			
4.	Were samples received in good condition and at the appropriate temperature?	Yes <b>X</b>	No
Comments:			
5.	Were sample holding times met?	Yes <b>X</b>	No
Comments:			
6.	Were correct concentration units reported?	Yes <b>X</b>	No
Comments:			
7.	Were detections found in laboratory blank samples?	Yes	No <b>X</b>
Comments:			
8.	Were detections found in field blank, equipment rinse blank, and/or trip blank samples?	NA	Yes <b>X</b>
Comments:			
9.	Were instrument calibrations within method criteria?	NA <b>X</b>	Yes No
Comments: Not Applicable, Level II data validation.			

10. Were surrogate recoveries within control limits?		Yes	No <b>X</b>
Comments: <u>VOCs</u> : All surrogates were within the 2014 National Functional Guidelines (NFG) for Organic Data Review acceptance criteria. <u>SVOCs</u> : Surrogate percent recoveries were less than the lower control limit in sample MW-33 for phenol-d6 (8%) and 2-fluorophenol (12%). Associated results were qualified as estimated detects (J-) and estimated non-detects (UJ). Surrogate percent recoveries were greater than the upper control limit in sample MW-13 for 2,4,6-tribromophenol (124%) and 2-fluorobiphenyl (120%). Associated results were qualified as estimated detects (J+) Reason Code: SURR			
11. Were laboratory control sample(s) (LCS/LCSD) sample recoveries within control limits?		Yes <b>X</b>	No
Comments:			
12. Were matrix spike (MS/MSD) recoveries within control limits?	NA	Yes	No <b>X</b>
Comments: Sample MW-6 was analyzed as the site-specific MS/MSD. The MS/MSD percent recoveries for sulfide (41 and 17%, respectively) were less than the SOPCAP lower control limit. Sulfide was not detected in the sample and was qualified as an estimated non-detect (UJ). Reason Code: MS			
13. Were RPDs within control limits?		Yes	No <b>X</b>
Comments: The MS/MSD RPD for sulfide in MW-6 (80) exceeded the SOPCAP control limit. Sulfide was not detected in the sample and therefore not qualified.			
14. Were dilutions required on any samples?		Yes <b>X</b>	No
Comments: <u>VOCs</u> : No dilutions were required <u>SVOCs</u> : No dilutions were required <u>Metals</u> : One samples required a 20X dilution prior to analysis <u>Sulfide</u> : No dilutions were required <u>Anions</u> : Seven samples required dilution prior to analysis, dilution factors ranged from 10X to 100X. <u>Alkalinity</u> : Two samples required a 100X dilution prior to analysis <u>Ferrous Iron</u> : Four samples required dilution prior to analysis, dilution factors ranged from 50X to 100X. Sample reporting limits were adjusted accordingly. No data were qualified.			
15. Were Tentatively Identified Compounds (TIC) present?	NA <b>X</b>	Yes	No
Comments: TIC not requested.			
16. Were organic system performance criteria met?	NA <b>X</b>	Yes	No
Comments: Not Applicable, Level II data validation.			
17. Were GC/MS internal standards within method criteria?	NA <b>X</b>	Yes	No

Comments: Not Applicable, Level II data validation.			
18. Were inorganic system performance criteria met?	NA X	Yes	No
Comments:			
19. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.		Yes X	No
<p>Samples MW-7 and DUP-2 were collected as the field duplicate pair.</p> <p>Duplicate RPDs were calculated for parameters detected in both the primary and field duplicate samples. The calculated RPD exceeded 50 for TOC; TOC was qualified as estimated (J) in both MW-7 and DUP-2.</p> <p>Reason Code: FDUP</p>			
20. Were at least 10 percent of the hard copy results compared to the Electronic Data Deliverable Results?		Yes	No X
<p>Initials SVR</p> <p>Comments: At the time data verification was performed, electronic data had not been loaded into the project database, so the comparison of hard copy results to EDD results could not be completed. After the data are loaded into the database, a review of hard copy results versus the electronic data will be performed.</p>			
21. Other?		Yes	No X
Comments:			
<b>PRECISION, ACCURACY, METHOD COMPLIANCE AND COMPLETENESS ASSESSMENT</b>			
Precision:	Acceptable X	Unacceptable	Initials SVR
Comments:			
Sensitivity:	Acceptable X	Unacceptable	Initials SVR
Comments:			
Accuracy:	Acceptable X	Unacceptable	Initials SVR
Comments:			
Representativeness:	Acceptable X	Unacceptable	Initials SVR
Comments:			
Method Compliance:	Acceptable X	Unacceptable	Initials SVR
Comments:			
Completeness:	Acceptable X	Unacceptable	Initials SVR
Comments:			